Chapter 26
FLOODPLAIN, STORMWATER, AND EROSION HAZARD MANAGEMENT*

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* **Editors Note:** Ord. No. 5777, § 1, adopted May 23, 1983, repealed ch. 26, pertaining to swimming pools, bath houses and bathing places, in its entirety. Former ch. 26 was derived from Ord. No. 3002, § 2, adopted June 26, 1967, as amended by Ord. No. 5722, §§ 1, 3, adopted Feb. 28, 1983. Ord. No. 5802, § 1, adopted July 5, 1983, specifically repealed Ord. No. 5722, §§ 1, 3, from which §§ 26-70 and 26-72 had been derived. For a complete sectional disposition, see the Code Comparative Table at the back of this volume.

Subsequently, Ord. No. 7407, § 5, adopted June 25, 1990, added a new ch. 26.

Note: Ord. No. 10209, § 1, adopted Oct. 18, 2005, amended the title of ch. 26 to read as herein set out. Prior to inclusion of said ordinance, ch. 26 was entitled, "Floodplain and Erosion Hazard Management."

Note: Ord. No. XXXXX, adopted XXXXXXXX, amended Article I to reflect updates including additional requirements to reflect State Floodplain Ordinance Model..

Comment [EL1]: Update notes to reflect Mayor And Council approval date of this revision to Article I. City Atty to review.

Cross References: Spa/pool code, § 6-181 et seq.

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page numbering is for draft review only and will not show on final product

Article I. In General

Division 1. Floodplain and Erosion Hazard Area Regulations

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ARTICLE I.
IN GENERAL

DIVISION 1.
FLOODPLAIN AND EROSION HAZARD AREA REGULATIONS

Sec. 26-1. Purpose.

These floodplain and erosion hazard area regulations are intended to protect human life and health, promote and protect the public health, peace, safety, comfort, convenience, and general welfare; to meet state and federal requirements, thereby allowing residents of the city to purchase flood insurance; receive disaster relief should the need arise and obtain residential and commercial real estate loans; to manage uses of the floodplains, recognizing that the highest and best use of the regulatory floodplains in the city is for the maintenance of hydrologic and hydraulic processes, with consideration for aesthetics, natural open space, recreation areas and wildlife habitat; to minimize flood and erosion damage; to protect and preserve groundwater recharge; to minimize costs to the city;

Comment [EL2]: City Atty Office suggested re-wording for redundancy – will discuss with State.

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minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public; to encourage the most effective expenditures of public money for drainage projects; to minimize prolonged business interruptions; minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in special flood hazard areas; to help maintain a stable tax base by providing for the sound use and development of special flood hazard areas so as to minimize blight areas caused by flooding; to notify potential buyers when a property is in a Special Flood Hazard Area; participate in and maintain eligibility for flood insurance and disaster relief; to accommodate anticipated runoff; to preserve the natural areas, streams, washes, arroyos, rivers, and drainage courses in their natural riverine condition whenever possible and that any land use proposal which utilizes this approach be considered superior to all others; to recognize that southwestern watercourses are unstable and that their physical characteristics may change; and to ensure that those who occupy the areas within a regulatory floodplain or erosion hazard area assume the responsibility for their actions.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-1.1. Authority.

The Mmayor and Ceouncil, pursuant to the powers and jurisdiction vested by A.R.S. title 9, chapter 4, article 6.1, section 9-462.01(A)(8), and (9), and title 48, chapter 214, article 1, section 48-3610, et seq., and other applicable laws, statutes, orders and regulations of the city, do hereby exercise the power and authority to adopt floodplain and erosion hazard area regulations for the city. The ~~mayor and council~~City of Tucson Mayor and Council, within city limits, shall delineate, through this chapter for areas where development is ongoing or imminent or becomes imminent, the criteria for development within floodplains in a manner that is consistent with the criteria developed by FEMA and the Director of the Arizona Department of Water Resources.

(Ord. No. 7407, § 5, 6-25-90; Ord. No. 10311, § 1, 8-8-06)

Sec. 26-1.2. Applicability.

These floodplain and erosion hazard area regulations shall be applicable and enforceable in all incorporated areas of the city for all developments located within the floodplains, as defined herein, including public lands and to erosion-prone areas (as described in section 26-11.1(b)) located within the corporate limits of the city.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-1.3. Basis for establishing areas of special flood hazard.

The performance requirements as specified in this chapter are minimum standards and address general floodplain management requirements. Specific projects may warrant additional requirements. The ~~mayor and council~~ Mayor and Council, acting as the

Comment [EL3]: "to" added in several locations per City Atty Office.

Comment [EL4]: Reference is from ARS Title 9 - Cities and Towns
Chapter 4 - General Powers
Article 6.1 - Municipal Zoning
Section 9-462.01 - Zoning regulations; public hearing; definitions

A. Pursuant to this article, the legislative body of any municipality by ordinance may in order to conserve and promote the public health, safety and general welfare:

8. Establish floodplain zoning districts and regulations to protect life and property from the hazards of periodic inundation. Regulations may include variable lot sizes, special grading or drainage requirements, or other requirements deemed necessary for the public health, safety or general welfare.

9. Establish special zoning districts or regulations for certain lands characterized by adverse topography, adverse soils, subsidence of the earth, high water table, lack of water or other natural or man-made hazards to life or property. Regulations may include variable lot sizes, special grading or drainage requirements, or other requirements deemed necessary for the public health, safety or general welfare.

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~~floodplain board~~Floodplain Board and the city engineer have the authority to establish standards and/or policies as necessary to carry out the provisions of this chapter.

The special flood hazard areas identified by the Federal Emergency Management ~~Insurance~~ Administration (~~FIA~~FEMA) in a scientific and engineering report entitled "The Flood Insurance Study (FIS) for Pima County, Arizona and Incorporated Areas~~the City of Tucson, Arizona~~," dated September 28, 2012 ~~June 16, 2011~~ ~~February 8, 1999~~, with any accompanying flood insurance rate maps (FIRM) and all subsequent amendments and/or revisions thereto are hereby adopted by reference and declared to be a part of this chapter. The ~~flood insurance study (~~FIS~~)~~ is on file with~~at~~ the floodplain section of the Engineering Division at~~of~~ the Planning and Development Services Department~~Department of Transportation~~. The FIS and FIRM are the minimum areas and standards of applicability of this chapter and may be supplemented by studies for other areas which allow implementation of this chapter and which are approved by the city engineer, Floodplain Board, and FEMA. All river and basin management plans, or other land use plans approved by the ~~mayor and council~~ Mayor and Council, are hereby incorporated into this chapter and made a part thereof by reference. Engineering drainage design standards, approved by the city engineer as revised on an ongoing basis to include the most current practices and methodologies, will be used in creating river and basin management plans.

The FIS and FIRM shall apply to all territory annexed into the city at the time of annexation. The floodplain administrator shall notify FEMA and Arizona Department of Water Resources (ADWR) of acquisition by means of annexation, incorporation or otherwise, of additional areas of jurisdiction.

Sec. 26-1.4 Methods of Reducing Flood Losses ~~ETHODS OF REDUCING FLOOD LOSSES~~

In order to accomplish its purposes, this Ordinance includes methods and provisions to:

A. Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion, flood heights or velocities;

B. Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

C. Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;

D. Control filling, grading, dredging, and other development which may increase flood damage; and

E. Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

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Comment [EL5]: Updated to reflect latest revision.

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(Ord. No. 7407, § 5, 6-25-90; Ord. No. 10311, § 1, 8-8-06)

Sec. 26-2. Definitions.

The following definitions shall apply to words and phrases used in this division:

Accessory structure *means* *a* structure that is on the same parcel of property as a principal structure, the use of which is incidental to the use of the principal structure.

Appeal means a request for a review of the Floodplain Administrator's interpretation of any provision of this Ordinance or a request for a variance.

Area of shallow flooding *means a* designated Zone AO or AH on a community's FIRM with a one percent or greater annual chance of flooding to an average depth of one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

Arizona Department of Water Resources (ADWR) is the state agency assigned with oversight of floodplain management/flood control as provided in Title 48, Chapter 21 of the Arizona Revised Statutes (A.R.S.).

Balanced basin means a drainage basin which contains floodwater channels, natural or manmade, and/or flood control structures that are adequate to contain existing runoff from the regulatory storm produced by the basin, but in which additional runoff cannot be safety contained by said channels or structures.

Base flood ~~*or regulatory flood*~~ means the flood having a one (1) percent chance of being equaled or exceeded in any given year. ~~, and where the base flood peak discharge is 100-cfs or greater for the 100-year event.~~

Base flood elevation (BFE) means the calculated water-surface elevation of the base flood~~, where the base flood peak discharge is 100-cfs or greater.~~ For a special flood hazard area, the BFE means the elevation shown on or calculated from~~or~~ the FIS or FIRM, including Zones A, AE, ~~AO,~~ AO1, AO2, ~~AO3,~~ and AH, where the FIS or FIRM indicates the water surface elevation resulting from a base flood. FIS Profile shall be used when available. Other elevations shall be determined by an engineering study.

Basement means any area of the building having its floor subgrade (below ground level) on all sides.

Basin management plan means a site-specific plan for a watershed or balanced or critical basin which has been prepared for and approved by the city engineer, and which provides a conceptual plan for orderly development of flood control measures within the basin.

Comment [EL6]: JG: Suggestion to make sure that all acronyms used are clearly defined.

Comment [EL7]: Per City Atty Office, for consistency, "means" added instead of colon (:). [TYP]

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Comment [EL8]: Check with State as to whether this is and, or condition.

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Comment [EL9]: Per ST, clarifying circular reference to Drainage Manual definition of regulatory flood.

Comment [EL10]: Added per Pima County RFCD floodplain ordinance section 16.08.600

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Comment [EL11]: Included to reflect current FIRM designations within the City of Tucson.

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Breakaway wall means a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

Building: See "Structure."

Community means any state, area or political subdivision thereof, or any Indian tribe or authorized tribal organization, or authorized native organization, which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction.

Critical basin means a drainage basin which contains floodwater channels, natural or manmade, and/or flood control structures that cannot contain existing runoff produced by the regulatory flood within the basin, and which has a documented history of severe flooding hazards.

Critical Facility means any new public or private facility, or any addition to an existing public or private facility, that is used for public emergency management. Critical Facilities shall be designed and constructed to be located outside of FEMA SFHA and other 100-year jurisdictional floodplains, and provide a minimum lowest floor elevation ~~FFE~~ set at or above 500-year WSEL, or the RFE_{CF} = BFE +2-ft~~, which ever is greater~~. Critical facilities include: airport facilities, emergency incident command centers, other emergency facilities including fire stations, police departments; utility facilities; nursing homes or elderly care facilities; ~~private or public~~ hospitals; ~~pharmacies,~~ storage facilities that have hazardous materials; and schools or day care facilities. Other critical facilities may be designated as determined by City Administration (Department Directors with City Manager or designee's concurrence).

Cumulative damage or improvement means the market value of all improvements to a structure over a 10-year period for the purpose of determining substantial damage or improvement.

Detention system means a type of flood control system which delays the downstream progress of floodwaters in a controlled manner, generally through the combined use of a temporary storage area and a metered outlet device which causes a lengthening of the duration of flow and thereby reduces downstream flood peaks. Reduction of runoff shall be provided per current City of Tucson Standards.

Development means any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, landscaping, paving, excavation, drilling operations, or storage of equipment or materials.

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Comment [EL12]: Needs other Stakeholders' input (Zoning & City Atty, Fire, Police, and others.)

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Comment [EL13]: (moved this phrase from the end)

Comment [EL14]: Added per TDOT meeting 10JAN13.

Comment [EL15]: Deleted revision per TDOT meeting 10JAN13.

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Comment [EL16]: Deleted revision per TDOT meeting 10JAN13.

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Comment [EL17]: NAFSMA recommends: Police Stations ...

Comment [EL18]: Added per TDOT meeting 10JAN13.

Comment [EL19]: Need to further discuss Critical Facility designation verbiage.

Comment [EL20]: Clarified per City Atty Office so that impacted departments would be included in determining critical facility.

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Comment [EL21]: LM: there is a question to further discuss - whether regulatory language should be included in definition section - as in the proposed definitions of "detention system"," dry well" and "retention system."

Comment [EL22]: Added to clarify 15% current reduction as listed in memo/letter in Drainage Manual.

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Drainage basin means any watershed or stormwater catchment land area, above a point on a watercourse which traverses the basin and to which the waters drain and collect.

Dry well means a device that is used to dispose of floodwaters through a process of passive infiltration of floodwaters into the vadose zone, below the ground surface. Unless specifically used for water re-charge, dry wells are restricted to post-construction drainage solutions where all drainage requirements are met.

Dwelling unit means a place of residence which may be located in a single- or multiple- dwelling building or a manufactured home.

Encroachment means the advancement or infringement of land uses, fill or structures, or development, into the floodplain that impedes, alters, or reduces the flow capacity of the channel and regulatory floodplain of a watercourse. Floodway encroachment lines mean the lines marking the limits of floodways on Federal, State and local flood plain maps.

Erosion means the process, either rapid or gradual, of the wearing away of land masses by water flow forces. This peril is not, per se, covered under the National Flood Insurance Program (NFIP).

Erosion hazard area means the land area adjoining a watercourse regulated by this chapter which is deemed by the city engineer to be subject to FEMA or local flood-related erosion losses.

Exhibit 1. See exhibit 1 at end of this section.

Existing manufactured home park or subdivision means a manufactured home park for which the construction of facilities for servicing the lot on which the manufactured homes are to be affixed (including, at a minimum, the installation of utilities, either final site grading or the pouring of concrete pads, and the construction of streets) is completed on or before ~~March 22, 1982~~ August 2, 1982.

Expansion to an existing manufactured home park or subdivision means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, either final site grading or pouring of concrete pads, or the construction of streets).

FEMA means the Federal Emergency Management Agency or designate successor agency that is responsible for the administration of the National Flood Insurance Program (NFIP) to provide flood insurance and to establish flood prone areas and development regulations.

Flood or *flooding* means a general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of floodwaters; (2) the

Comment [EL23]: LM: there is a question to further discuss - whether regulatory language should be included in definition section - as in the proposed definitions of "detention system"," dry well" and "retention system."

Comment [EL24]: Dry wells have been determined to frequently lose percolation potential within the City limits. To assist in assuring higher rates of development success and saved time and costs to both the City staff and developers, restricted use of dry wells are recommended.

Comment [EL25]: Added per CFR 59.1

Comment [EL26]: Confirm with State whether this is a separate definition.

Comment [EL27]: This date needs to be confirmed with State and City Atty.

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Comment [EL28]: Ask City Atty if these two sections need to stay – altho' they are CFR they are not ARS

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unusual and rapid accumulation or runoff of surface waters from any source; and/or (3) the collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in this definition. ~~the unusual and rapid accumulation of runoff of surface waters from any source when two (2) or more lots or two (2) or more acres become flooded.~~

Flood hazard map(s) (FHM) means an official map(s) of a community, issued by the city engineer, where the boundaries of the flood and/or related erosion hazard areas have been designated as ~~zone A~~ local floodplain and/or erosion hazard zones, ~~other than the official flood insurance rate maps~~.

Flood ~~insurance~~ Insurance ~~rate~~ Rate ~~map~~Map(s) (FIRM) means the official map(s) on which the Federal Emergency Management Agency ~~Insurance Administration~~ has delineated both the areas of special flood hazards (SFHA) and the risk premium zones applicable to the community. These maps, which are approved by the city engineer and adopted by the ~~floodplain board~~Floodplain Board, provide information regarding floodplains of the city.

Flood insurance study (FIS) means the official report provided by ~~FIA~~FEMA that includes flood profiles, FIRM and the water surface elevation of the base flood as set forth in the FIS ~~dated February 8, 1999~~June 16, 2011~~, and as subsequently amended and/or revised in the manner approved by FEMA~~.

Floodplain or *flood-prone area* means any land area susceptible to being inundated by water from any source (see definition of "flood").

Floodplain administrator means the city engineer, or designee, who is the community official designated by title to administer and enforce the floodplain management regulations.

~~*Floodplain board*~~*Floodplain Board* means the ~~mayor and council~~City of Tucson Mayor and Council at such times as they are engaged in the enforcement of this ordinance.

~~*Floodplain and erosion hazard area regulations* means zoning ordinances, subdivision regulations, building codes, health regulations, housing codes, setback requirements, open space area regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance and erosion control ordinance) and other applications of police power. The term describes such state or local regulations, in any combination thereof, which provide standards for the purpose of flood and erosion damage and reduction.~~

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Comment [EL29]: This sentence was under discussion with State agency to be removed for redundancy – however, this appears to have a legal aspect so it remains until City Atty Office review.

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Comment [EL30]: Redundant

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Floodplain management means the operation of an overall program of corrective and preventive measures for reducing flood damage and preserving and enhancing, where possible, natural resources in the floodplain, including but not limited to emergency preparedness plans, flood control works, floodplain management regulations, and open space plans.

~~*Floodplain and erosion hazard management regulations;* The ordinance and other zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as grading and erosion control) and other application of police power which control development in flood prone areas. This term describes federal, state or local regulations in any combination thereof, which provide standards for preventing and reducing flood loss and damage.~~

Floodplain and erosion hazard area management regulations means this Ordinance and other zoning ordinances, subdivision regulations, building codes, health regulations, housing codes, setback requirements, open space area regulations, special purpose ordinances (such as a floodplain ordinance, grading ordinance and erosion control ordinance) and other applications of police power which control development in flood prone areas. The term describes such state or local regulations, in any combination thereof, which provide standards for preventing and reducing both erosion damage and flood loss and damage.

Floodplain use permit means an official document which authorizes specific activity within a regulatory floodplain or erosion hazard area.

Floodproofing means any combination of structural and nonstructural additions, changes or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

~~*Floodplain use permit* means an official document which authorizes specific activity within a regulatory floodplain or erosion hazard area.~~ *Flood-related erosion* means the collapse or subsidence of land along the shore of a lake, watercourse, or other body of water as a result of undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as a flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding

Floodway or regulatory floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. See exhibit 1.

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Comment [EL31]: These two paragraphs were combined. See definition of *Floodplain and erosion hazard area management regulations* below.

Comment [EL32]: The 1st paragraph was suggested to be revised/deleted per State agency – however this will remain until City of Tucson Atty review.

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Floodway fringe means the land outside the floodway lying at or below the base flood elevation along a watercourse, and includes that area of the floodplain on either side of the regulatory floodway where encroachment may be permitted. See exhibit 1.

Freeboard means a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size of flood and floodway conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.

Functionally dependent use means a use which cannot perform its intended purpose unless it is located or carried out in close proximity to water. The term includes only docking facilities, port facilities that are necessary for the loading and unloading of cargo or passengers, and ship building and ship repair facilities, and does not include long-term storage or related manufacturing facilities

Governing Body means <definition>

Hardship means, as related to Section 26-12 of this ordinance, the exceptional hardship that would result from a failure to grant the requested variance. The City of Tucson Mayor and Council requires that the variance be exceptional, unusual, and peculiar to the property involved. Mere economic or financial hardship alone is not exceptional. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors likewise cannot, as a rule, qualify as an exceptional hardship. All of these problems can be resolved through other means without granting a variance, even if the alternative is more expensive, or requires the property owner to build elsewhere or put the parcel to a different use than originally intended.

Highest adjacent grade means the highest natural elevation of the ground surface prior to construction next to the proposed walls of a structure.

Historic structure means any structure that is:

(1) Listed individually in the National Register of Historic Places (a listing maintained by the Ddepartment of the Iinterior) or preliminarily determined by the Ssecretary of the Iinterior as meeting the requirements for individual listing in the National Register.

(2) Certified or preliminarily determined by the Ssecretary of the Iinterior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Ssecretary to qualify as a registered historic district.

(3) Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Ssecretary of the Iinterior.

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Comment [EL33]: Clarified by City Atty Office. [Replaced "also" with "and includes"].

Comment [EL34]: Added per Model.

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Comment [EL35]: Definition added per Model. State Agency expects this definition in the ordinance per 44CFR 59.1 – waiting to see whether this term is optional, and to discuss with City Atty. Further discussion: Tucson has a few lakes and therefore, definition is included.

Comment [EL36]: Needs to be added – missing from last version… needs to be confirmed with City Atty Office [City Engineer and/or Mayor and Council].

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(4) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either of the following:

a. By an approved state program as determined by the ~~secretary~~ Secretary of the ~~interior~~Interior, or;~~.~~

b. Directly by the ~~secretary~~ Secretary of the ~~interior~~ Interior in states without approved programs.

—*Lowest floor* means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided that such enclosure is not built so as to render the structure in violation of the applicable nonelevation design requirements of section 26-5.2 & .3 of this chapter. See definition of "*Basement*".

Major wash or *major watercourse* means any watercourse which drains a contributing drainage basin of less than thirty (30) square miles and generates a base flood peak discharge of twenty-five hundred (2,500) cubic feet per second (cfs), or greater. Examples of major washes include but are not~~r~~ necessarily limited to: Alamo Wash, Cholla Wash, at and downstream from Mission Road, Pima Wash, Rodeo Wash, Silvercroft Wash, Tucson Arroyo, and West Branch of the Santa Cruz River Washes.

Manufactured home means a structure, transportable in one (1) or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes, the term "manufactured home" does not include a "recreational vehicle."

Manufactured home park or manufactured home subdivision means a parcel (or contiguous parcels) of land divided into two (2) or more manufactured home lots for rent or sale.

Market value is determined by estimating the cost to replace the structure in new condition and adjusting that cost figure by the amount of depreciation that has accrued since the structure was constructed. The cost of replacement of the structure shall be based on a square foot cost factor determined by reference to a building cost estimating guide recognized by the building construction industry. The amount of depreciation shall be determined by taking into account the age and physical deterioration of the structure and functional obsolescence as approved by the floodplain administrator, but shall not include economic or other forms of external obsolescence. Use of replacement costs or accrued depreciation factors different from those contained in recognized building cost estimating guides may be considered only if such factors are included in a report prepared by an independent professional appraiser and supported by a written explanation of the differences.

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Mean sea level means, for purposes of the NFIP, the National Geodetic Vertical Datum (NGVD) of 1929, North American Vertical Datum (NAVD) of 1988, or other datum, to which base flood elevations shown on a community's FIRM's are referenced.

Minor watercourse or *minor wash* means a watercourse which conveys or collects a 100-year (base flood) peak discharge of less than twenty-five hundred (2,500) cubic feet per second (cfs), but more than one hundred (100) cfs.

New construction means structures for which the "start of construction" commenced on or after the effective date of August 2~~March 22~~, 1982, ~~when floodplain management regulations were adopted by the city, and~~ when the FIRM became effective, and includes any subsequent improvements to such structures. For floodplain management purposes, "new construction" means structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

New manufactured home park or subdivision means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of March 22, 1982, when floodplain management regulations were adopted by the city ~~and the FIRM became effective~~.

Obstruction means any matter, including but not limited to a dam, wall, wharf, embankment, levee, dike, pile, abutment, projection, excavation, channel rectification, bridge, conduit, culvert, building, wire, fence, rock, gravel, vegetation, refuse, fill, or structure in, along, across or projecting into any channel, watercourse, stream, lake or regulatory flood hazard area which may impede, alter, retard or change the direction of the flow of water, either in itself or by catching or collecting debris carried by such water, or that is placed where the flow of water might carry the same downstream to the damage of life or property.

One-hundred-year flood or 100-year flood is a common name for the flood having a one percent chance of being equaled or exceeded in any given year. See "Base flood."

Person means any individual or his agent, firm, partnership, association, corporation, or agent of the aforementioned groups, or the state, or any agency or political subdivision thereof.

Reach is a hydraulic engineering term to describe longitudinal segments of a watercourse.

Reclamation plan means a plan for sand and gravel operations which defined hydrological and hydraulic constraints; outlines methods of extraction, operation and site development; and provides for backfilling procedures and final site reclamation.

Comment [EL37]: August 2, 1982 is the effective date of the first FIRM for the City of Tucson per FIS. To be verified by City Atty and State.

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Comment [EL38]: To be verified by City Atty and State.

Comment [EL39]: This is the date the City adopted the fp regulations. There is a question as to whether this should be changed to January 20, 1975 per State Agency suggestion. City Atty will need to assist in this item.

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Recreational vehicle means a vehicle which is:

(1) Built on a single chassis;

(2) Four hundred (400) square feet or less when measured at the largest horizontal projections;

(3) Designed to be self-propelled or permanently towable by a light-duty truck; and

(4) Designed primarily not for use as a permanent dwelling but as a temporary living quarters for recreational, camping, travel or seasonal use.

Regional watercourse means a large watercourse, which may have intermittent flow, draining a contributing drainage basin of thirty (30) square miles or greater. Examples of regional watercourses include but are not necessarily limited to the Santa Cruz River, Rillito Creek, Pantano Wash, Tanque Verde Wash, and Canada Del Oro Wash.

Regulatory flood [~~See definition of "Base Flood."] i~~includes the base flood and drainage areas where the Q100 is equal to or greater than 100 cubic feet per second for the 1% flood event.

Regulatory floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Regulatory flood elevation (RFE) means the elevation which is one (1) foot higher than the calculated water surface elevation of the base flood, unless pertaining to critical facilities where the minimum lowest floor elevation ~~FFE~~ is set at or above 500-year WSEL, or Regulatory Flood Elevation for Critical Facility (RFE_{CF}) = BFE +2-ft~~, whichever is greater~~. In an AO Zone, ~~residential construction, new or substantial improvement, shall have the lowest floor, including basement, elevated to or above the regulatory flood elevation, or elevated at least two feet above the highest adjacent grade if no depth number is specified~~ the RFE shall be one foot higher than the depth number specified on the FIRM, or two feet if no depth number is specified.

Regulatory floodplain means that portion of the natural floodplain that would be inundated by the ~~base~~ regulatory flood. It includes that area where drainage is or may be restricted by manmade structures or those areas which are subject to sheet flooding, or those areas mapped as being floodprone on existing recorded subdivision plats, and also includes areas where the Q100 is equal to or greater than 100 cubic feet per second for the 1% flood event. Also see exhibit 1.

Retention system means a type of flood control facility which stores surface runoff and stops the downstream progress of surface water runoff or flood by employing methods of total containment. No flow is discharged directly into a downstream watercourse from a retention system or basin, except for bleed pipes to assure minimum drain-down time is

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Comment [EL40]: Also added AO zone requirements on page 27 - for State Model compliance section 5.1.C.1.a.

Comment [EL41]: Added per 31JAN13 meeting with TDOT.

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Comment [EL42]: Clarified by City Atty Office.

Comment [EL43]: Tucson has AO zones for 1-ft, 2-ft, and 3-ft depths.

Comment [EL44]: JG: Further discussion - for consistency of defining regulatory flood elevation, this section was repeated as shown in FPO sections 26-5.2(9) & 26-8(d)(3)

Comment [EL45]: Also clarified by City Atty Office.

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met. Infiltration rate shall include safety factor of 2, or, provide bleed pipe with spillway at maximum 6 inches above basin bottom. The stored water may infiltrate into the subsurface ground layers.

Setback means the minimum horizontal distance between a structure and a watercourse. On each side of a watercourse, the setback is measured from the top edge of the highest channel bank or edge of the base flood water surface elevation, whichever is closer to the channel center line.

Sheet flooding means those areas which are subject to flooding with depths of one-half (1/2) foot or greater during the base flood where a clearly defined channel does not exist and the path of the flooding is often unpredictable and indeterminate.

Special flood hazard area (SFHA) means an area ~~having special flood,~~ of floodplain subject to a 1 percent or greater chance of flooding in any given year~~, or flood-related erosion hazards, which is the land area inundated by the base flood~~. SFHA are shown on a FIRM as Zones A, ~~AO,~~ AO(1), AO(2), ~~AO3,~~ ~~A1--30~~, AE, ~~A99~~ or AH.

Start of construction includes substantial improvement and other proposed new development, and means the date the building permit was issued, provided the actual start of construction, repair, rehabilitation, addition, placement or other improvement was within one hundred eighty (180) days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading, and filling below existing ground surface; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations, or the erection of temporary forms. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

Structure means, for floodplain management purposes, a walled and/or roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured home. "Structure" for insurance coverage purposes, means a walled and roofed building, other than a gas or liquid storage tank, that is principally above ground and affixed to a permanent site, as well as a manufactured home on a permanent foundation. For the latter purpose, the term includes a building while in the course of construction, alteration or repair, but does not include building materials or supplies intended for use in such construction, alteration or repair unless such materials or supplies are within an enclosed building on the premises.

Substantial damage means damage of any origin sustained by a structure whereby the cost of repairing or restoring the structure to its before damaged condition would equal or exceed fifty (50) percent of the market value of the structure before the

Comment [EL46]: LM: there is a question to further discuss - whether regulatory language should be included in definition section - as in the proposed definitions of "detention system"," dry well" and "retention system."

Comment [EL47]: Per TDOT discussions 10JAN12. Response to repeated post-construction basin issues occurring at development sites, as well as providing reduction of mosquito problems.

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Comment [EL48]: This section updated to reflect current DFIRM SFHA's within the City of Tucson. (13FEB13)

Comment [EL49]: City of Tucson jurisdictional flood areas that include: COT FH, A, AE, AO(1), AO(2), and AH.

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damage occurred. ~~Substantial damage also means flood-related damage sustained by a structure on a number of two separate occasions during a rolling 10-year period for which the sum total of percentage of cost or of repairs at the time of each such flood event, on average, equals or exceeds twenty-five (25) percent of market value of the structure before the damage occurred. The term includes cost of repairs cumulatively added, in percentage, for a period of 10-years.~~

Substantial improvement means any reconstruction, repair, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds fifty (50) percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage" regardless of the actual repair work performed. The term includes cost of improvements cumulatively added, in percentage, for a period of 10-years. The term does not, however, include either:

(1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or

~~(2)~~ ~~(2)~~ Any alteration of an "historic structure~~.~~" provided that the alteration will not preclude the structure's continued designation as a "historic structure." ~~(2)~~

Variance means a grant of relief by the ~~floodplain board~~Floodplain Board from the requirements of this chapter which permits development in a manner that would otherwise be prohibited by the terms of this chapter.

Violation means the failure of a structure or other development to fully comply with the community's floodplain management regulations. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in this Ordinance is presumed to be in violation until such time as that documentation is provided to the City of Tucson for review and acceptance.~~this chapter~~.

Watercourse master plan means a comprehensive plan adopted by the board that provides uniform, but separate, rules for watercourses where a higher level of protection is warranted for public safety or to preserve integrity of the watercourse, as provided by ARS Section 48-3609.01. These include the river and/or basin management plans, such as Tucson Stormwater Management Study (TSMS).

Water surface elevation means the height, in relation to the National Geodetic Vertical Datum (NGVD) of 1929, North American Vertical Datum (NAVD) of 1988, or other datum, of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.

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Comment [EL50]: Changed "or" to "of" to read: 'cost of repairs'

Comment [EL51]: State FPO Model higher standards 2.0: Flood-related damages sustained by a structure on two separate occasions during a 10-year period for which the cost of repairs at the time of each such event, on the average, equals or exceeds 25 percent of the market value of the structure before the damage occurred. This is also known as "repetitive loss."

Comment [EL52]: Per FEMA Unit 8, improvement and repair projects undertaken over a period of 5, 10 years or life of project are cumulative. When they total 50 percent, the building must be brought into compliance as if it were new construction. The 10 year term was chosen since this period of time is a commonly used time period.

Comment [EL53]: Procedures for calculating percentages and time will be provided in policy and future technical standard updates.

Comment [EL54]: See Cumulative definition.

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Comment [EL55]: Clarified per City Atty Office.

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Watercourse means a lake, river, creek, stream, wash, arroyo, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

Watershed means "drainage basin." See definition of "drainage basin."

Zone A means no BFE's determined.

Zone AE means BFE's determined.

Zone AH means flood depths of one to three feet (usually areas of ponding); BFE's determined.

Zone AO means flood depths of one to three feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

Zone X (unshaded) means areas determined to be outside the 0.2% annual chance floodplain.

Zone X (shaded) means areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

(Ord. No. 7407, § 5, 6-25-90; Ord. No. 10311, § 1, 8-8-06)

Cross References: Definitions and rules of construction, § 1-2.

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Comment [EL56]: Should the City add City of Tucson Flood Hazard Area as a definition of other jurisdictional floodplain?

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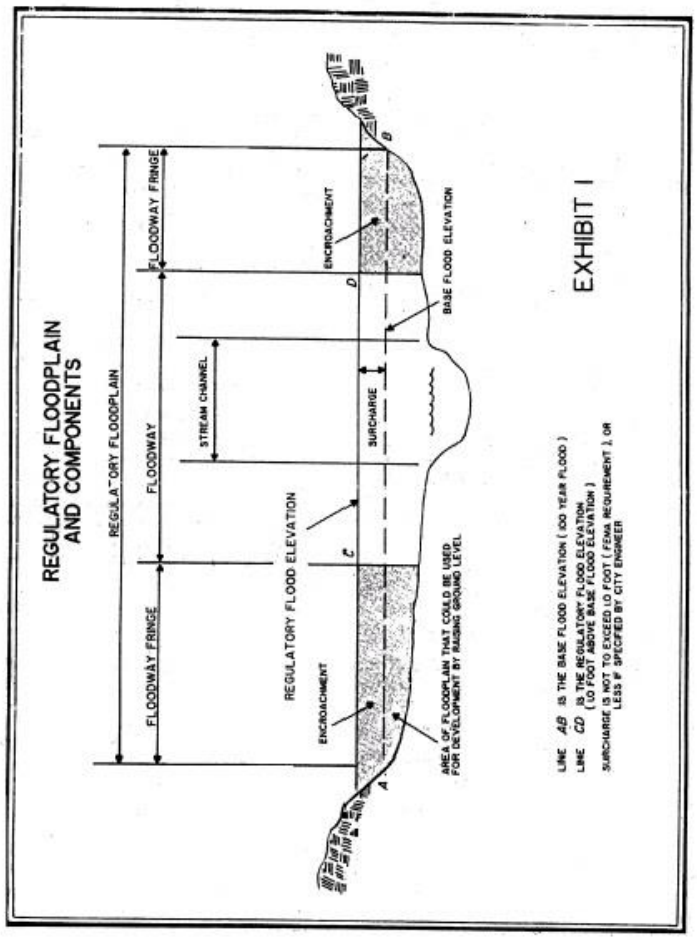

Exhibit 1. REGULATORY FLOODPLAIN AND COMPONENTS

Sec. 26-3. Floodplain boundaries, elevations.

(a) *Boundaries:* The boundaries of the regulatory floodplains and floodways shall be shown on maps maintained by the city engineer using the best available hydrologic and hydraulic data, such as the flood hazard maps (FHM) and flood insurance rate maps (FIRM) provided by the Federal Emergency Management Agency (FEMA). The approximate boundaries of the regulatory floodplains shall also be shown on the city's building zone maps, which serve as the city's flood hazard maps.

For those watercourses where regulatory floodplains are not delineated on the maps maintained by the city engineer, the regulatory floodplains shall be determined by engineering studies. An engineering study shall mean the requirements of these

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regulations and shall include hydrologic and hydraulic analyses prepared by a state registered professional civil engineer and approved by the city engineer.

(b) *Elevations:* Where elevations of the base flood have been determined for the regulatory floodplain and floodway delineated on maps maintained by the city engineer (such as the elevations shown on the FEMA flood insurance rate maps, however, FIS profiles shall be used to determine BFE when available.), those elevations are hereby made a part of these regulations.

For those watercourses which are delineated on the FIRM as unnumbered A zones or where the base flood elevations have not been previously determined, the base flood elevations shall be determined by an engineering study. The study shall meet the requirements of these regulations and shall include hydrologic and hydraulic analyses prepared by a state-registered professional civil engineer and approved by the city engineer. The study shall further demonstrate that the determination of the base flood elevation and study methodology comply with any applicable criteria established by ADWR and FEMA.

(c) *Interpretation of boundaries:* Where uncertainty exists, the boundary of any regulatory floodplain or floodway shall be determined by the city engineer. The base flood elevation for the point in question shall be the governing factor in locating the floodplain area boundary on the land. A person contesting a boundary location shall be given a reasonable opportunity to substantiate an alternative location based on technical evidence.

(Ord. No. 7407, § 5, 6-25-90; Ord. No. 10311, § 1, 8-8-06)

Sec. 26-3.1. Floodplain boundary and flood elevation revisions.

(a) Whenever additional data becomes available and warrants floodplain elevation or boundary revisions, such revisions may be made by the city engineer at the request of property owners or developers upon submission of the necessary engineering calculations and maps prepared by a state-registered professional civil engineer in conformance with the requirements of this chapter, the ADWR, and the Federal Emergency Management Agency (FEMA). The City will submit the required flood insurance study information, in the form of any type of Letter of Map Change (LOMC) such as a Letter of Map Revision (LOMR) or Letter of Map Revision with Fill (LOMR-F), to Federal Emergency Management Agency (FEMA) within 15 days, and shall notify adjacent communities and ADWR.

Comment [EL57]: Added definition of LOMC.

(b) Whenever a watercourse is to be altered or relocated:

(1) Require that the flood-carrying capacity of the altered or relocated portion of the watercourse is maintained.

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(2) ~~(2)~~ Where appropriate, obtain a permit from the Ceorps of Eengineers in accordance with section 404 of the Clean Water Act.

~~(2)~~(3) A development permit is ~~and LOMC iares~~ required to be submitted for base flood elevation data for any subdivision proposal or other development greater than 50 lots or 5 acres, whichever is the lesser.

(c) The city engineer or his designated representative shall have the authority and responsibility to revise the regulatory floodplain and floodway boundaries and base flood elevations on the flood hazard maps (FHM) for the watercourses that are not included on the FIRM.

(1) The city engineer shall notify, within thirty (30) days after his ruling, the owner of each property for which floodplain boundaries and/or base flood elevations have been revised and those owners of adjoining property immediately upstream and downstream. Such specific notice shall not be required when such revisions have been made following a noticed public hearing on the property involved. In addition, the city engineer shall notify ADWR and FEMA.

(d) BFE's may increase or decrease resulting from physical changes affecting flooding conditions. Within one hundred twenty (120) days after completion of construction of any flood control protective works, the revised regulatory floodplain and/or floodway and the revised base flood elevations, in the areas affected by such work, shall be redefined, and shall be provided to the governing bodies of all jurisdictions affected. As soon as is practicable, but not later than six months after the date such information becomes available, the Floodplain Administrator shall notify the FEMA of the changes by submitting technical or scientific data in accordance with Volume 44 Code of Federal Regulations (CFR) Section 65.3. This submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premium rates and floodplain management requirements will be based upon current data. ~~Within one hundred twenty (120) days after completion of construction of any flood control protective works, the revised regulatory floodplain and/or floodway and the revised base flood elevations in the areas affected by such work shall be redefined.~~

(e) An appeal may be taken to the ~~floodplain board~~Floodplain Board by any person aggrieved by such revisions in accordance with section 26-12~~1.3~~ of this chapter.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-4. Statutory Exceptions ~~exemptions.~~

(a) As specified in A.R.S. sections 48-3609 and 48-3613, these regulations shall not:

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Comment [EL58]: Moved this section for 50-lots-5 acres to section 26-8.

Comment [EL59]: LM: suggestion to add definition of LOMC to FPO, or reword. [Added to FPO section 26-3.1(a) above]

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Comment [EL60]: Per State FPO Model 4.3.D.

Comment [EL61]: Per CFR

Comment [EL62]: This section was previously part of the ordinance – the Model verbiage was added to clarify.

Comment [EL63]: Added per CFR and ARS 48-3609.1 which is reflected in the state model 4.2.5.B.1.

Comment [EL64]: "Exceptions" is the more correct/current terminology to use per ARS. Get copy from Suzie to show City Atty Office.

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(1) Affect or apply to facilities constructed or installed pursuant to a certificate of environmental compatibility issued under the authority of A.R.S. title 40, chapter 2, article 6.2.

(2) Affect existing legal uses of property or the right to continuation of such legal use. However, if a nonconforming use of land, building, or structure is discontinued for twelve (12) months or destroyed to the extent of fifty (50) percent of its value, as determined by a competent appraiser, any further use shall comply with this article and these regulations.

(3) Affect reasonable repair or alteration of property for purposes for which the property was legally used on August 3, 1984, or the date on which any regulations affecting such property took effect; except that any alteration, addition or repair to a nonconforming building or structure which would result in increasing its flood damage potential by fifty (50) percent or more shall be either floodproofed (nonresidential structures only) or elevated to or above the regulatory flood elevation. All floodproofing (nonresidential structures only) shall be certified by a state-registered professional civil engineer. A record of such floodproofing shall be maintained on file with the city, which includes a certificate of floor elevation. See section 26-11.2(h).

(4) Affect the construction of streams, waterways, lakes and other auxiliary facilities in conjunction with development of public parks and recreation facilities by a public agency or political subdivision. Any such alteration must maintain the carrying capacity of the watercourse.

(5) Prohibit the construction of bridges, culverts, dikes and other structures necessary for the construction of public highways, roads, and streets intersecting or crossing a watercourse.

(6) Prohibit the construction of storage dams for watering livestock or wildlife, structures on banks of a creek, stream, river, wash, arroyo, or other watercourse to prevent erosion of or damage to adjoining land or dams for the conservation of floodwaters permitted by A.R.S. title 45, chapter 6, section 45-1201 et seq., and chapter 10, section 45-1701 et seq.

(7) Prohibit construction of tailing dams and waste disposal areas for use in connection with mining and metallurgical operations. This does not exempt those sand and gravel operations which will divert, retard or obstruct the flow of waters in any watercourse from complying with and acquiring authorization from the city engineer pursuant to regulations adopted by the ~~floodplain board~~Floodplain Board under this chapter.

(8) Prohibit the construction and erection of poles, towers, foundations, guy wires, and other facilities related to power transmission as constructed by any utility whether a public service corporation or a political subdivision.

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(9) Prohibit any flood control district, county, city, town or other political subdivision to exercise powers granted to it under A.R.S. section 48-3601 et seq.

(b) These exception~~emption~~s do not preclude any person from liability if that person's actions increase flood hazards to any other person or property. Before any construction authorized by this section may begin, plans for such construction must be submitted to the city engineer for review and comment, and/or issuance of a floodplain use permit. A drainage statement or report also may be required.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-4.1. Nonconforming development.

(a) *Improvements to, or Reconstruction of, Existing Nonconforming Development:*

(1) Any structure which is substantially improved at a cost equal to or exceeding fifty (50) percent of the full cash value of the structure as shown on the latest assessment rolls of the county assessor either (a) before the improvement or repair is started, or (b) if the structure has been damaged and is being restored, before the damage occurred, shall conform to these regulations. At the time of improving or reconstructing the existing structure or development, floodproofing (nonresidential structures only) may be considered as one of the means of bringing it in compliance with this chapter.

Comment [EL65]: Clarification added for applicability.

For the purpose of determining the value of any such construction, repair or alteration, the normal retail value of the materials and the reasonable value of labor performed shall be used.

(2) For the purpose of this chapter, "substantial improvement" is also considered to occur, but is not limited to, when the first alteration of any wall, ceiling, floor or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure.

(3) No person shall repair or alter property in any manner so as to avoid the provisions of this section.

(b) *Discontinuance of Nonconforming Development:* In the event that the use of a nonconforming development is discontinued for a period of twelve (12) consecutive months, any further use thereof shall be in conformity with the provisions of these regulations.

(c) *Condominium Conversions:* These regulations shall not apply to an existing legally constructed building which is subdivided for the purpose of conversion to condominium ownership as long as "substantial improvement" guidelines stated in subsections (a)1--3 of this section are met.

(Ord. No. 7407, § 5, 6-25-90)

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Sec. 26-5. Floodplain and erosion hazard area development.

Areas designated as floodways have a high potential for flooding. Land in the floodway should be set aside for the conveyance of floodwaters as a first priority. Floodways are also areas of major groundwater recharge, a characteristic which should be preserved and enhanced where possible. Floodways are areas of land that belong to the watercourse, while floodway fringe areas can be shared by people and the watercourse, provided the arrangement does not result in damage to either the people or the watercourse.

The requirements outlined in sections 26-5.1 and 26-5.2 below also apply to all land areas designated as AO zones on city FIRM.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-5.1. Floodway development.

Development in the floodway shall:

(1) Conform to adopted city land use plans for the design of public and private development in the floodplain.

(2) Not result in damage to public facilities as a result of erosion or flooding events.

(3) Not generate adverse impacts (including but not limited to erosion) upstream or downstream.

(4) Not unnecessarily alter riparian habitats of watercourses and adjacent bank areas.

(5) Not increase the base flood elevations. Certification by a registered professional civil engineer ~~or architect~~ shall be provided that demonstrates that the encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge.

(6) Not result in higher floodwater velocities which significantly increase the potential for flood or erosion damage.

(7) Not significantly increase channel or bank erosion.

(8) Not decrease groundwater recharge.

~~Tucson Code Sec.26-5.1~~(9)~~:~~ Development in the floodway shall not contain a waste disposal system wholly or partially.

(10) Not result in the placement of any structure or material that may divert, retard or obstruct the flow of floodwaters.

Comment [EL66]: Changed verbiage regarding type of registrant, per meeting with TDOT 31JAN13.

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Comment [EL67]: Per State FPO Model section 5.7.A Suggest rewording to clarify that demonstrating no BFE increase is needed at review stage as well as at as-built stage.

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(11) Not result in creating a danger or hazard to life or property.

(12) Not utilize structures except hydraulic structures and those structures exempted under section 26-4(4) through (8) of this Ordinance, which are designed and constructed to protect life or property from dangers or hazards of floodwaters.

(13) Not contribute to debris accumulation upstream and/or downstream.

(14) Not create a water pollution problem in the floodway due to soluble, insoluble, or solid materials, at the time of flooding.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-5.2. Floodway fringe development.

No development, storage of materials or equipment, or other uses shall be permitted which, acting alone or in combination with existing or future uses, create a danger or hazard to life or property. Development in the floodway fringe shall:

(1) Conform to adopted city land use plans for the design of public and private development in the floodplain.

(2) Not result in damage to public facilities as a result of erosion or flooding events.

(3) Not generate adverse impacts, including but not limited to erosion, upstream or downstream.

(4) Not unnecessarily alter riparian habitats of watercourse and adjacent bank areas.

(5) Not increase the base flood elevation more than one-tenth of a foot, as measured from the property boundary.

(6) Not result in higher floodwater velocities which significantly increase the potential for flood or erosion damage.

(7) Not significantly increase channel or bank erosion.

(8) Use, where appropriate, native and/or adaptive landscaping to enhance the open space character of the floodway fringe.

(9) Place the first (including basement) floor one foot above the base flood elevation. In an AO Zone, residential construction, new or substantial damage repairs or improvements, shall have the lowest floor, including basement, elevated to or above the regulatory flood elevation~~, or elevated at least two feet above the highest adjacent grade if no depth number is specified~~. ~~Following~~ Prior to the pouring of the first slab or lowest~~finish~~ floor installation and prior to any framing, the applicant shall submit to the

Comment [EL68]: To clarify and match other jurisdictions (PCRFCD & Santa Cruz County).

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Comment [EL69]: Redundant (see definition of regulatory flood elevation).

Comment [EL70]: JG: For consistency, this section was added to match definition and section 26-8(d)(3) of FPO which was added for State Model update.

Comment [EL71]: This is the procedure the City uses for pre-slab El Cert's. This lessens issues that might arise if the lowest floor was poured and then the pre-slab El Cert was submitted and was found not to be in compliance with minimum lowest floor requirements.

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city engineer certification by state-registered land surveyor or a state-registered professional civil engineer that the elevation of the lowest floor framework is in compliance with that approved by the city engineer's office, in the form prepared by ~~of a~~ FEMA ~~Form 086-0-33s~~ (Elevation Certificate) for preslab (Building Under Construction) and final (Finished Construction).

(10) Anchor all structures, material or equipment firmly to prevent their flotation.

(11) Place all service facilities such as electrical and heating equipment at or above the regulatory flood elevation.

(12) Be constructed so as to protect placed fill from erosion which could be caused by waters, or otherwise. Such fill shall be permitted only when demonstrated by the owner/developer that it will have some beneficial purpose, as determined by the city engineer, and the amount of proposed fill is not in excess of what is necessary to achieve that purpose. The fill shall be protected from erosion which could be accomplished by placing riprap, vegetative cover, bulk heading, or any other Floodplain Administrator ~~city engineer~~ approved methods. Certification of compaction shall be provided as determined by the Floodplain Administrator.

(13) Prohibit storage and/or processing of materials that are buoyant, flammable, explosive or that could be injurious to human, animal or plant life at the time of flooding.

(14) Locate on-site sanitary waste disposal systems to avoid impairment to them or contamination from them during flooding.

(15) Locate water supply, water treatment and sewage collection and disposal systems to eliminate or minimize infiltration of floodwaters into these systems and discharge of materials from these systems into floodwaters.

(Ord. No. 7407, § 5, 6-25-90; Ord. No. 10311, § 1, 8-8-06)

Sec. 26-5.3. Special flood hazard areas.

In areas of special flood hazards, the minimum criteria for approval of any development shall require compliance with all applicable regulations adopted by these regulations, the ADWR and FEMA, whichever is more restrictive.

(Ord. No. 10311, § 1, 8-8-06)

Sec. 26-6. Extraction of sand, gravel and other earth products; permit required.

A floodplain use permit shall be required for extraction of sand, gravel and other earth products within a floodway or floodplain (which includes the floodway fringe areas) or erosion hazard areas. An engineering study outlining effects on stream mechanics prepared by a state- registered professional civil engineer shall be required with an

Comment [EL72]: Add matching verbiage from El Cert.

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Comment [EL73]: JG: suggestion to add type of required El Cert form. Also match section 26.11.2(h) &26-5.2(9).

Comment [EL74]: JG: suggestion to add verbiage for fill to be 95% compaction. This is required if the homeowner ever wants to get a LOMR based on fill. Community acknowledgment form with supporting geotechnical certification. (Further discussion.)

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application for a floodplain use permit for major extraction operations, for operations in locations that appear to be hazardous because of their relative proximity to structures or banks of watercourses, and for any other operations considered by the city engineer to be potentially hazardous. The operations plan and any engineering study required shall meet the approval of the city engineer. For other operations, a study may be required, at the discretion of the city engineer, depending upon the nature of the proposed operation.

The engineering study is for the purpose of evaluating the possible flood- and erosion-related hazards and must include considerations of effects of the excavation on water velocities, direction of flows, volume of flows, channel geometry (shape and size), type of channel banks, depth of flow, and other items that may be pertinent to stream mechanics, which includes an analysis indicating a balanced sediment flow system or channel aggradation, and resultant effects on structures (including but not limited to roads, bridges, culverts and utilities), banks of watercourses, adjoining lands, and groundwater recharge for the respective alluvial watercourse.

Floodplain use permits for sand and gravel mining operations shall be issued for a time limit of one (1) year only. All such permits are subject to review by the city engineer prior to issuance. No mining operation shall be commenced without an approved permit.

In granting the permit, the city engineer may impose restrictions/conditions regarding the location and boundaries of the area where excavations/stockpiles are allowed, the quantity of excavations/stockpiles, and time period and methods of operation.

After July 25, 1990, the effective date of this section, any extraction of sand and gravel or related materials in the floodway, floodway fringe or erosion hazard areas shall be allowed only if a reclamation plan is also provided for the extraction operation. The reclamation plan shall show that all adverse effects of extraction are mitigated. The plan shall also contain a timetable and financial assurances for accomplishing reclamation.

The city engineer may require bonds or other financial assurances appropriate for the sand and gravel extraction operation.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-6.1. Stockpiling.

(a) There shall be no stockpiling within the floodway of materials or tailings that may obstruct, divert or retard the flow of floodwaters, except as may be approved by the city engineer pursuant to an application for a floodplain use permit.

(b) The storage or processing of materials that are in time of flooding buoyant, flammable, explosive, or that could be injurious to human, animal or plant life is prohibited. Storage of other materials or equipment may be allowed if it is not subject to major damage by floods, and is firmly anchored to prevent flotation, or is readily removable from the area within the very short time available after a flood warning.

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(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-6.2. Standards for construction of utility systems.

All new and replacement water supply and sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the system and discharge from systems into floodwaters.

On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

Waste disposal systems shall not be installed wholly or partially in a floodway.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-7. Erosion hazard areas and setbacks from watercourses.

The banks of watercourses constitute an erosion hazard zone which is subject to channel widening and/or meandering. Setback distances are best determined by a detailed engineering study performed by a state-registered professional civil engineer. Guidelines for such studies and for determining setbacks are found in the *Standards Manual for Drainage Design and Floodplain Management in Tucson, Arizona (Standards Manual).*

Setbacks from unstabilized banks may be determined by use of methodology found in the *Standards Manual.*

Reduced setbacks may be considered at the discretion of the city engineer only upon submitting to the city a detailed engineering study performed by a state-registered professional civil engineer for review and approval.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-7.1. Setbacks on regional watercourses.

If a detailed engineering study is not performed, the minimum setback to structures shall be as indicated in table I or from the appropriate formulas from the *Standards Manual* unless the banks are stabilized. When banks are stabilized to the level of the base flood (plus an appropriate freeboard) the setback to structures shall be fifty (50) feet.

Table I

Watercourse	Minimum Setback in Straight Section (Feet)	Minimum setback in Curved Section (Feet)
Pantano Wash	350	870

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Rillito Creek	360	895
Santa Cruz River	490	1,220

Setbacks for other regional watercourses may be determined from guidelines in the *Standards Manual.*

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-7.2. Setbacks on all other watercourses.

When the banks are stabilized to the level of the base flood (plus an appropriate freeboard) the setback to structures shall be a minimum of twenty (20) feet for access and maintenance. When access and maintenance easements are not required by the city engineer, the minimum setback may be reduced to ten (10) feet at the discretion of the city engineer. When banks are not stabilized, the setback to structures shall be as calculated from guidelines in the *Standards Manual.*

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-8. Subdivision and development project requirements.

The requirements outlined in subsections (a) through (i) below apply to all improved or unimproved land areas or lands divided for the purpose of financing, sale or lease, whether immediate or future, the boundaries of which have been fixed by or proposed to be fixed by a recorded plat and which are located in flood hazard areas. These regulations shall also apply in instances where development plans are required by chapter 23, Tucson Zoning Code of the Tucson Code.

(a) All new subdivision proposals and other proposed development (including proposals for manufactured home parks and subdivisions), greater than 50 lots or 5 acres, whichever is the lesser, shall:

(1) Identify the special flood hazard area and the elevation of the base flood; and

(2) Identify on the final plans the elevation(s) of the proposed structure(s) and pads. If the site is filled above the BFE, the final lowest floor and grade elevations shall be certified by a registered professional engineer or surveyor and provided to the Floodplain Administrator.

Comment [EL75]: Adding a (1) & (2) per CFR 60.3(b)(3)

Sec.26-8(a) *Suitability of Land:*

Sec.26-8(a)(1) Land physically unsuitable for subdivision or development because of severe flooding, drainage or erosion problems endangering life or property shall not be subdivided or developed unless it can be developed in such a way so as to alleviate those problems.

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(2) Additionally, if a subdivision proposal or other proposed new development is in a floodprone area, any such proposals shall be reviewed, designed and constructed to assure that:

a. All such proposals are consistent with the need to minimize flood and erosion damage within the floodprone area;

b. All public utilities and facilities such as sewer, gas, electrical and water systems are located and constructed to minimize or eliminate flood and erosion damage;

c. Adequate drainage is provided to reduce exposure to flood and erosion hazards.

(3) When planning and designing developments adjacent to, surrounding or affected by watercourses, the owner/developer should conform to policies set forth in the adopted general plan of the city, existing basin management plans, and this chapter. In those areas where basin management plans have not yet been formulated, the first consideration in approaching alternative drainage design concepts shall be to maintain the natural configuration to reduce exposure to flood and erosion hazards as well as promote groundwater recharge. Where natural washes cannot be maintained, a mitigation plan shall be established with emphasis being placed on earthen or naturally appearing channels with landscaping and texture/color added to bank protection materials. The design of earthen channels will be encouraged in order to allow for a more permeable surface which permits reintroduction of the water into the groundwater system, allowing for the reintroduction of native plant species which promotes a natural, partially soil-stabilized system.

(b) *Delineation of Areas Subject to Flooding on Plats and Development Plans:*

(1) All tentative plats and development plans submitted shall show the location, by survey or photographic methods, of streams, watercourses, canals, irrigation laterals, private ditches, culverts, lakes and other water features, including those areas subject to flooding and/or erosion. The location shall also include the direction and magnitude of any flow, water surface elevations, and the limits of inundation from the base flood.

(2) All tentative plats and development projects in floodprone areas shall be accompanied by conceptual grading plans and conceptual drainage improvement plans included in a drainage statement or a drainage report prepared by a state-registered professional civil engineer, for approval by the city engineer, unless exempted by the city engineer. These reports or statements should include the following:

a. The methods for mitigation of increased urban peak and/or volumetric flood-water runoff or discharge created by the development on-site and to upstream and downstream properties, up to a reasonable location as determined by the approved hydrologic and hydraulic study.

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b. The demonstration that the improvements are compatible with the existing upstream and downstream drainage conditions and that any proposed grading and/or grade change will not have an adverse impact on adjacent property.

c. The methods for adequate erosion and sediment control, as approved by the city engineer.

d. The proposed floodplain management methods for floodproofing (existing nonresidential structure only), drainage control, detention, retention, and/or delineating and setting aside floodprone areas which result in mitigating a flood or erosion hazard on the proposed finished pads (elevations determined) and drainage slopes constructed to protect building foundations from runoff waters.

Comment [EL76]: Added comma.

(3) All tentative plats and development plans in floodprone areas shall show proposed grading and improvement for areas which are subject to flooding or erosion or which have poor drainage. Also included will be a description and location of all facilities proposed to be used to alleviate flooding, erosion or other drainage problems, both in the proposed subdivision or development, and downstream and upstream of any watercourse affected by the subdivision or development, whether they are within or outside the project boundaries.

Prior to commencement of any site improvements or grading, a grading plan shall be submitted to the city engineer for review and approval. Detailed improvement plans of storm drains or channel improvements shall also be submitted to the city engineer for review and approval.

(4) All final plats and development plans in floodprone areas shall show limits of the regulatory floodplains, erosion hazard boundaries, and the floodways and floodplains delineated in a surveyable manner and certified by a state-registered land surveyor.

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(5) All tentative plats and development plans in floodprone areas of all developments, including manufactured home parks and subdivisions, submitted shall include base flood elevation data. Also included as a general note shall be the drainage area(s) and their respective base flood peak discharges.

(c) *Street Design Criteria:* Streets required for permanent access shall be designed and paved/constructed so that the flow depths over them do not exceed one (1) foot in depth except at drainage crossings during the base flood peak discharge. At least one (1) paved permanent access shall be provided to each lot over terrain which can be traversed by conventional motor vehicles in times of flooding. Where the streets are also used for flow of stormwater additional safety features may be required by the city engineer. Fill may be used for streets in areas subject to flooding provided such fill does not unduly increase flood heights. Developers may be required to provide profiles and elevation of streets in areas subject to flooding.

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(d) *Building Sites:* Land which contains area within a floodplain shall not be divided or platted for residential occupancy or building sites unless each lot contains a building site, either natural or manmade, which is not subject to flood-related erosion or to flooding by the base flood, provides all weather access to the building pad, and is certified for compaction of fill for pad by an engineer.

(1) In areas subject to flooding where no fill is proposed to be used, the building line shall be located no closer to the floodplain than the edge of the area subject to flooding by the base flood.

(2) ~~Tucson Code Chap 26 Article I Sec.26-8(d)(2)~~ In areas where fill is to be used to raise the elevation of the building site, the building line shall be located not less than twenty-five (25) feet landward from any edge of the fill, unless a study prepared by a state-registered professional civil engineer and approved by the city engineer shows that a lesser distance is acceptable.

(3) No fill shall be placed in any floodway; nor shall any fill be placed where it diverts, retards or obstructs the flow of water to such an extent that it creates a danger or hazard to life or property in the area.

(4) ~~(3)~~ In an AO Zone, residential construction, or new or substantial damage repairs or improvements, shall have the lowest floor, including basement, elevated to or above the regulatory flood elevation, or elevated at least two feet above the highest adjacent grade if no depth number is specified.

(e) *Setbacks From Channels:* Setbacks shall be established in accordance with the *Drainage Standards Manual* or city engineer approved studies prepared by a state-registered professional civil engineer. Also see section 26-7 of this chapter.

(f) *Rights-of-way for Drainage; Easement Dedication:* Whenever a subdivision plat or development plan contains a watercourse which is regulated by this chapter, all right-of-way associated with the watercourses shall be provided and designated "drainageway" or "drainage easement" as determined by the city engineer.

At the discretion of the city engineer, structural solutions to drainage problems will be required.

When structural solutions are necessary, preference shall be given to landscaped natural appearing channels. While improvements to watercouses should be responsive to the environment, existing conditions may prevent or inhibit the desired approach. Examples of such existing conditions include insufficient right-of-way, insufficient runoff carrying capacity in the channel, large erosion potential, existing residences or businesses exposed to flooding during runoff events, and inadequate street conveyance capacity.

The additional land area required for the purpose of widening, deepening, aligning, improving, stabilizing, constructing and allowing for natural meanders so the watercourse

Comment [EL77]: Added to match UDC requirements.

Comment [EL79]: Clarified by City Atty Office.

Comment [EL78]: Added per current procedures.

Comment [EL80]: This section was separated from (2) for clarity. Renumbering was provided in this section.

Comment [EL81]: Clarified by City Atty Office.

Comment [EL82]: Per State FPO Model section 5.1.C.1.a. We may want to consider moving this verbiage, leaving the verbiage repeated as shown in this revision, or, only defining under definition of Regulatory Flood Elevation. For consistency of defining regulatory flood elevation, this section was repeated as shown in FPO definition & section 26-5.2(9). Latest recommendation: remove since it is redundant.

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will safety convey the base flood peak discharge shall also be included in the drainageway or drainage easement.

(1) If the watercourse is an improved regional watercourse, the drainageway shall include the channel, the channel improvements, and a fifty-foot-wide area measured outward from the front face of the top of the bank protection, for the city or for county flood control district uses.

(2) If the watercourses is an improved major or minor watercourse, the drainageway or the easement shall include the channel, the channel improvements, and necessary maintenance access.

(3) If the watercourse is to remain natural, the drainageway shall contain the boundaries of the regulatory floodplain and necessary maintenance access.

(4) Along regional watercourses and major watercourses where the peak discharge during the base flood is ten thousand (10,000) cubic feet per second or greater, the drainageway shall be dedicated in fee simple to the city.

(5) Along other watercourses, the city engineer shall determine whether it is necessary for the city to have control of the drainageway. If the city engineer determines that public control is necessary, the owner shall dedicate the drainageway in a fee simple or grant an easement.

(g) *Detention/Retention Systems:* (See section 26-10 of this chapter.)

(h) *Utilities:* All public and private utilities are to be constructed so as to minimize or eliminate flood damage and shall comply with the provisions of section 26-6.2.

(i) *Arizona Revised Statutes (A.R.S.) Section 48-3610 Compliance:* The city engineer upon receipt of an application for any development in a floodplain shall advise the Pima County Regional Flood Control District ~~county flood control district~~ ("district") in writing and provide a copy of the application and any development plan, tentative plat, or a floodplain use permit application within one (1) mile of the corporate limits of the city. The district shall also provide similar development applications to the city which are located within one (1) mile outside of the corporate limits of the city. Written notice and a copy of the development plan and/or tentative plat shall be sent to the district no later than three (3) working days after the receipt by the city engineer.

(j) *Construction Conformance:* All construction including the detention/retention systems (see section 26-10) shall conform to the city engineer approved plans and specifications. Any deviation shall occur only upon prior approval by the city engineer.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-9. Standards for manufactured homes and manufactured home parks and subdivisions.

Comment [EL83]: JG: suggestion to clarify PCRFCD; to read "Pima County Regional Flood Control District" (other sections should be checked to read the same when it references the county flood control)

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All new and replacement manufactured homes, additions to existing manufactured homes or additions to existing manufactured home parks or subdivisions, and recreational vehicles which are left on a site for longer than one hundred eighty (180) days or are not licensed and ready for highway use shall be securely anchored to an adequately anchored foundation system to resist flotation, collapse or lateral movement. Methods of anchoring may include but are not to be limited to use of over-the-top or frame ties to ground anchors. The provisions of this paragraph and subsection (a)(1) do not apply to recreational vehicles which are on a site for fewer than one hundred eighty (180) days and which are fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system and is attached to the site only by quick disconnect type utilities and security devices and has no permanently attached additions.

(a) *General Provisions:*

(1) All newly placed, repaired or replacement manufactured homes, additions to existing manufactured homes and recreational vehicles, where applicable, shall be placed and elevated so that the bottom of the structural frame or the lowest point of any attached appliances, whichever is lower, is at or above the regulatory flood elevation.

(2) A manufactured home placed in an existing manufactured home park which has incurred substantial damage by a flood may be repaired or may be replaced by another manufactured home. If the damage is less than fifty (50) percent of its value before the flood, it may be repaired or may be replaced by another manufactured home.

(3) All public and private utilities shall be located and constructed so as to minimize or eliminate flood damage.

(4) A plan for evacuating residents of all manufactured home parks or subdivisions located within floodprone areas shall be developed and filed with and approved by the county department of emergency services, disaster planning and preparedness. A copy of the approved plan shall be submitted to the city engineer's office for record.

(b) *Certification:* Certification by a state-registered professional civil engineer that the installation of a manufactured home meets all of the requirements of this section is required. Such certification shall be provided by the person installing the manufactured home, the owner, the developer of the manufactured home park or subdivision, or an agency regulating manufactured home placement, whichever is deemed appropriate by the city engineer. Certification of elevations listed on the floodplain use permit shall be prepared by a state- registered land surveyor and provided to the city engineer prior to habitation of the structure in the form of an Elevation Certificate prepared by ~~:FEMA Form 086-0-33s(ELCERT)~~ for Building Under Construction stage or at Final Construction.

(Ord. No. 7407, § 5, 6-25-90)

Comment [EL84]: Further discussion needed for this more restrictive regulation, perhaps during monsoon season. 13FEB13

Comment [EL85]: JG: further discuss this section to consider providing a definition or exception to temporary construction trailers that are also on site less than 180 days and are installed to meet the temporary requirements.

Comment [EL86]: Per CFR, only recreational vehicles may have this provision, not temporary construction trailers.

Comment [EL87]: JG: suggestion to add type of required El Cert form, to match FPO section 26-5.2(9) & 26-11.2(h).

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Sec. 26-10. Detention/retention systems.

(a) When deemed necessary by the city engineer, flood detention/retention systems shall be employed in lieu of or in combination with structural flood control measures to reduce flooding potential or restrict it to a level no greater than pre-platting and/or pre-development conditions.

All proposed residential net densities of three (3) or more units per acre and all proposed commercial and industrial developments greater than one (1) acre in size shall provide some method of peak and volumetric runoff reduction. The amount of reduction is stipulated within the *Stormwater Detention/Retention Manual*, which was approved for use by the city engineer as development standard 10-01.0.

(b) Basins which have been identified by the city engineer as unsuitable for additional development because of the high probability of increased flooding, or flooding of existing improvements or properties not previously studied, may be developed further only upon the incorporation of adequate detention/retention systems as reviewed and approved by the city engineer. The following criteria shall be considered:

(1) If a drainage basin is determined to be a balanced basin, detention or retention systems shall be employed. These systems shall maintain the existing balance within the basin by limiting the flood peak discharges from the site to values no greater than pre-developed conditions.

(2) If a drainage basin is determined to be a critical basin where potential flood problems currently exist, detention or retention systems shall be employed. The purpose of such systems in a critical basin shall be to reduce the potential flood hazard through the detention or retention of storm runoff in fair and equitably apportioned increments.

(c) The design of a detention or retention system, as reviewed and approved by the city engineer, shall include consideration of the degree of existing development within the basin and the capacity of the downstream drainage facilities. The systems will be designed with strict conformance to the public's health, safety and welfare. The effects of recharging storm runoff and possible pollution of the groundwater shall be evaluated for all systems employing infiltration systems, such as dry wells, in order to prevent contamination of the groundwater aquifer.

(d) Structural flood control measures may be utilized in conjunction with or in place of a detention/retention system if it can be clearly demonstrated that such measures shall accomplish, with an equal or greater degree of success, the function of such system, which includes preservation of the water and sediment equilibrium in the affected watercourse and mitigation of the environmental impacts. Appropriate structural flood control measures, such as channelization to a logical conclusion downstream of the proposed development and/or improvements to existing off-site flood control systems within the affected drainage or stream reach, shall be completed in accordance with plans reviewed and approved by the city engineer.

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(e) A fee may be utilized in place of a detention/retention system, at the request of affected persons, when it can be clearly demonstrated that detention at the site does not provide off-site flood relief due to the parcel size, location within the drainage basin, or other factors. The fees collected will be used to construct public flood control improvements which will be designed to mitigate the potential damage of floodwaters associated with the property from which the fees are contributed. In balanced and critical basins, and where development is less than three (3) units to the acre, use of a fee system may be considered appropriate in lieu of a detention system in order to preserve the natural drainage patterns. The amount of the fee shall be proportional to the cost of the otherwise required detention/retention system.

(f) The city engineer shall prepare and retain for public inspection and use an official map designating critical and balanced basins within the city.

(g) All repairs and maintenance of detention/retention systems shall conform to the city engineer approved design drawings and specifications. Any deviation shall occur only if approved by the city engineer.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-11. Floodplain use permit requirements and regulations.

(a) Except as otherwise provided in these regulations, it shall be unlawful for any person to establish, erect, alter or relocate a use or structure in the regulatory floodplain or an erosion-prone area as described in section 26-11.1(2) without first obtaining a floodplain use permit from the city engineer.

(b) It shall be unlawful for any person to perform any grading operation in or alteration of any watercourse in violation of this chapter. Without written authorization from the city engineer, any such act, including excavation of any kind, is a public nuisance per se and may be abated, prevented or restrained by action of the city.

(c) No license, permit or other similar approval for any development which would be in conflict with the provisions of this chapter shall be issued by any department, official or employee of the city; and any such license, permit or approval, if issued in conflict with the provisions of this chapter, shall be considered null and void.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-11.1. City engineer review of floodplain and erosion hazard area development.

The city engineer shall review all of the following applications for compliance with these regulations:

(1) Applications for development within a regulatory floodplain and erosion hazard areas.

Comment [EL88]: A map has been created and watershed lists updated to reflect the addition of the Lee Moore Wash Watershed as a Balanced Basin Management Area. Suggest providing a copy of Map at M&C presentation of revised FPO.

Comment [EL89]: JG: suggested adding a link to the map.

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(2) Applications for development requiring building permits within an area five hundred (500) feet on either side of delineated floodway boundaries in floodplains having watersheds larger than thirty (30) square miles, or two hundred fifty (250) feet on either side of watercourses having watersheds between ten (10) and thirty (30) square miles, and one hundred (100) feet on either side of watercourses having watersheds less than ten (10) square miles shall be reviewed. If, within ten (10) working days, the city engineer determines that the location is subject to floor or erosion hazards, an application for a floodplain use permit pursuant to section 26-11.2 is required. Property owners may request a preliminary determination from the city engineer for property in such areas prior to any application for actual development.

(3) Applications for subdivision plat approval.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-11.2. Floodplain use permit procedure.

(a) *General:* Upon receiving an application for a floodplain use permit, the city engineer shall, within five (5) working days, review the application to ensure that the site is free from flooding, declare the application complete, or:

Comment [EL90]: All sections of the Ordinance will need to checked for compliance to SB1598 to assure time-constrained actions are in compliance with new State regulations and match current procedures.

(1) Require the applicant to submit, where applicable, plans in triplicate drawn to scale, showing the nature, location, dimensions and elevation of the lot, existing or proposed structures, fill, storage of materials, floodproofing measures (existing nonresidential structures only), and the relationship of the above to the location of any watercourse channel, floodway, regulatory floodplain, erosion hazard area boundaries, and the regulatory flood elevation of the structures. All elevations or vertical distances must be referenced to an established datum or base elevation.

(2) Require the applicant to furnish as much of the following additional information as the city engineer deems necessary for the evaluation of effects of the proposed development upon flood flows and erosion:

a. A typical valley cross section showing the channel of the stream, elevation of land areas adjoining each side of the channel, cross sectional areas to be occupied by the proposed development, and high water information.

b. Plan (surface view) showing elevations or contours of the ground; structure, fill or storage elevations; size, location and spatial arrangement of all proposed and existing structures on the site; location and elevations of streets, water supply lines, sanitary sewers and waste disposal facilities; photographs showing existing land uses and vegetation upstream and downstream; soil types; and other pertinent information.

c. Profile showing the slope of the bottom of the channel or flow line of the stream or watercourse.

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d. Specifications for building construction and materials, filling, dredging, grading, channel improvement, storage of materials, water, and sewage facilities.

e. An engineering study prepared by a state-registered professional civil engineer outlining the effects the development will have on the flow of water through the area being developed and the surrounding areas. This study will be for the purpose of evaluating possible flood hazards and shall, where necessary, include consideration of the effects of the development on flood heights, water velocities, direction of flow, sedimentation and/or erosion, volume of flows, channel shape and size, type of channel banks and other items that may be pertinent, and the resultant effects or structures, land, banks, etc., for the adjacent regulatory floodplain and the surrounding area.

f. A soils investigation study prepared by a state-registered professional civil engineer, outlining the determination of the erosive properties of areas or lands to be graded or disturbed which may create sediment deposition or erosion in any watercourse or watershed regulated by this chapter.

(3) Require applicants to submit an additional copy of the development plan and/or subdivision plat, including the pertinent reports of the studies performed for forwarding to the county flood control district ("district"), if the proposed development in the floodplain is located within one (1) mile of the boundary between the city and the district's area of jurisdiction. The city shall also advise any city or town in writing and provide a copy of any development plan of any major development proposed within a regulatory floodplain, floodway or erosion hazard area which could affect regulatory floodplains, floodways, erosion hazard areas or watercourses within the district's area of jurisdiction. Written notice as required above and a copy of the plan of development shall be sent to any adjacent jurisdiction no later than three (3) working days after having been received by the city.

(4) Require the applicant to obtain all necessary permits from those governmental agencies from which approval is required by federal or state law, including section 404 of the Federal Water Pollution Control Act Amendment of 1972, 33 U.S.C. 1334.

~~26-11.2~~(b) *Conditions:* Any floodplain use permit may be subject to conditions or restrictions designed to reduce or mitigate the potential damage or hazard to life or property resulting from development within the regulatory floodplain, floodway or erosion hazard areas.

Any grading or alteration (including excavation) of any watercourse regulated by this chapter shall be controlled to minimize the loss of soil through erosion from rainfall or stormwater flowage. Methods to control erosion and sedimentation must be demonstrated to the satisfaction of the city engineer prior to the granting of a floodplain use permit for any work in any floodplain. Both temporary and permanent measures for sediment and erosion control must be clearly delineated on plans or other written documents prior to receiving a floodplain use permit.

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Examples of conditions that may be imposed include, but are not limited to, the following:

~~26-11.2(b)~~(1) -Modification of sanitary sewer, waste disposal, and water supply facilities.

(2) Limitations on periods of use and hours of operation.

(3) Imposition of operational controls, sureties related to temporary uses, and deed restrictions.

~~Tuc Code Sec.26-11.2(b)~~(4) ~~:~~ Requirements for construction of channel modifications, dikes, levees and other protective measures.

(5) All new construction and substantial dmge repairs or improvements (including the placement of prefabricated buildings and manufactured homes) shall:

a. Be designed (or modified) and adequately anchored to prevent flotation, collapse or lateral movement of the structure;

b. Be constructed with materials and utility equipment resistant to flood and erosion damage; and

c. Be constructed by methods and practices that minimize flood and erosion damage.

(6) Indemnification agreements whereby the applicant agrees to hold the city and its officials, employees and agents, harmless and defend them from any and all claims for damages now and in the future relating to the use of the property sought to be developed by reason of flooding, flowage, erosion or damage caused by water, whether surface, flood or rainfall.

(7) Dry f~~F~~loodproofing measures for existing nonresidential structures, which shall be designed to be consistent with the regulatory flood elevation for the particular area, flood velocities, durations, rate of rise, hydrostatic and hydrodynamic forces, and other factors associated with the base flood. The city engineer may require that the applicant submit a plan or document certified by a state-registered professional civil engineer that the floodproofing measures are consistent with the regulatory flood elevation and associated flood factors for the particular area. Examples of floodproofing measures may be obtained from the city engineer approved drainage design standards. Floodproofing for nonresidential structure construction, or new or substantial damage repairs or improvements, shall either be elevated to conform to regulations, or together with attendant utility and sanitary facilities:

a. Be floodproofed so that the structure is watertight with walls substantially impermeable to the passage of water; and

Comment [EL91]: This section describes dry floodproofing.

Comment [EL92]: JG: Follow-up to add verbiage regarding definitions or explanation of difference between wet and dry flood proofing. Specify in FPO i.e. residential (storage/parking) has to be vented, and wet floodproofing for structure to the RFE, existing commercial buildings can be floodproofed with the Engineer's certification.

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b. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and

c. If structure is elevated, b~~B~~e certified by a registered professional surveyor as certified by an accepted dry floodproofing elevation certificate.

d. If structure is floodproofed by other means than elevating, be certified by a civil engineer.

(8) Wet floodproofing requires f~~F~~lood vent certification ~~is required~~. All new construction and substantial damage repairs or improvements with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access or storage, and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwater. Designs for meeting this requirement must meet or exceed the following criteria:

a. Have a minimum of two openings, on different sides of each enclosed area, having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of floodwater; or

b. ~~If it is not feasible or desirable to meet the openings criteria stated above,~~ Alternatively, a registered civil engineer may design and wet-floodproof-certify the openings.

(c) *Revocation of Permit:* Any person who fails to comply with the terms of the floodplain use permit or has created situations that can be a danger to life and property as determined by the city engineer shall be subject to revocation of the floodplain use permit by the city engineer upon written notice by registered mail to the applicant citing the reasons for revocation. The person holding the floodplain use permit or any affected party may appeal the decision of the city engineer by requesting in writing a hearing before the ~~floodplain board~~Floodplain Board in accordance with section 26-12.

(d) *Removal of violation:* Upon written notice, the city engineer may cause any structure, encroachment or work constructed without a floodplain use permit, or which is in violation with the terms of a permit, to be removed immediately at the expense of the person who caused the structure, encroachment or work if the structure, encroachment or work will cause an immediate danger to life and property.

(e) *Recovery of costs:* The city shall be entitled to recover all costs, administrative, engineering and legal, as well as actual costs to remove or modify the structure, encroachment and/or any other work in violation of this chapter.

(f): *Factors upon which a decision of the city engineer shall be based:* In reviewing floodplain use permit applications, the city engineer shall consider, in addition to relevant factors specified in other sections of these regulations, any other provision of law relating

Comment [EL93]: BC: If the structure is raised above the elevation that would make sense, but if items a. and b. have been followed I don't think a surveyor has the ability to certify the structure. Referred question to other stakeholders for additional feedback.

Comment [EL94]: Clarified by input from engineering consultant.

Comment [EL95]: Per State Floodplain Ordinance Model section 5.1.C.2.

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Comment [EL96]: LM: suggestion to re-word entire section for clarification.

Comment [EL97]: Per State Floodplain Ordinance Model section 5.1.C.3

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to such development. In making such a determination, the city engineer may consider the following factors:

(1) The danger to life and property due to increased flood heights, velocities or altered direction of flow caused by the development.

(2) The danger that materials may be swept onto other lands or downstream to cause injury to others.

(3) The proposed water supply, sanitary sewer systems and waste disposal systems of any development and the ability of these systems to prevent disease, contamination and unsanitary conditions due to flooding and/or erosion.

(4) The susceptibility of the proposed development and/or its contents to flood and erosion damage and the effect of such damage on the individual owner.

(5) The availability of alternative locations for the proposed use on the same property which are not subject to flooding or erosion.

(6) The compatibility of the proposed use with existing regulatory floodplain uses and with floodplain management programs anticipated in the foreseeable future.

(7) The relationship of the proposed use to any comprehensive plan, basin management plan, neighborhood plan, and floodplain management program for the area.

(8) The safety of access to the property in times of flood for conventional and emergency vehicles.

(9) The expected heights, velocity, duration, rate of rise, and sediment transport of the floodwaters expected at the site under both existing and proposed conditions.

(10) The enhancement and preservation of groundwater recharge and the potential pollution of the groundwater supply.

(11) Such other factors, including but not limited to cost to the city, which are relevant to the purposes of these regulations.

(12) Documentation that all necessary permits have been obtained from state and federal agencies.

(g) *Decision:* The city engineer shall, within fifteen (15) working days of the application's being declared complete, render a decision on the floodplain use permit. A floodplain use permit shall be denied if the proposed development constitutes a danger or hazard to life and/or property.

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(h) *Certificate of flood elevation:* Prior to the issuance of final occupancy permits for development undertaken pursuant to a floodplain permit, the applicant shall submit, on a form provided by the city ~~(for elevation cCertificate for projects in SFHA, use current: FEMA Form 086-0-33s(ELCERT) for both stages for Building Under Construction and for Finished Construction),~~ certification that the elevation (in relation to mean sea level) of the lowest floors (including basement) of all new or substantially improved, or substantially damage repaired, structures is at or above the regulatory flood elevation. The certificate shall also disclose the method used to determine the regulatory flood elevation and the required erosion hazard setback, if any. The certification shall be signed by a state-registered professional civil engineer or land surveyor. Following acceptance of a certificate by the city engineer, a copy shall also be maintained in the building safety division records of the development. For elevation c~~C~~ertificate for projects in SFHA or other jurisdictional floodplains, use current~~:~~ FEMA Form for both stages for Building Under Construction and for Finished Construction.

The city engineer shall maintain for public inspection and furnish upon request, for the determination of applicable flood insurance risk premium rates within all areas having special flood hazards identified on an FHM or FIRM, any certifications and information on the elevation (in relation to mean sea level) of the level of the lowest flood (including basement) of all new or substantially improved structures.

(i) *Fees:* ~~The following~~ F~~f~~ees are imposed on applications for floodplain use permits as provided in the City of Tucson's fee schedule requirements in the Administrative Manual and/or Technical Standards.

~~Flood status requests . . . . . $ 15.00~~

~~Floodplain use permit . . . . . 50.00~~

~~Review of engineering studies, including review of first resubmittal . . . . . 150.00~~

~~Review of subsequent resubmittals . . . . . 300.00~~

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-11.3. Penalties, violations, unlawful acts, classifications.

(a) *Civil infraction:* Except as provided in subsection (b) below, it is unlawful and is hereby declared a civil infraction for any person to:

(1) Fail to obtain any floodplain use permit; or

(2) Fail to comply with the terms and conditions of any permit required by this chapter; or

(3) Violate any of the provisions of this chapter.

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Comment [EL98]: JG: suggestion to add type of required El Cert form, to match FPO section 26-5.2(9).

Comment [EL99]: Clarified by City Atty Office.

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Comment [EL100]: Floodplain Use Permit fees will be updated to reflect these services as well as additional services provided – including preparing or processing elevation certificates, flood data research time, printing copies of reports, creating diskettes for consultants, and will be based on a current fee schedule and added / updated in the Administrative Manual.

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All violations under this section shall be heard under the procedures set forth in chapter 28 of this Tucson Code. Additionally, any person found responsible under this section shall be punished by a fine of not less than fifty dollars ($50.00) and not more than twenty-five hundred dollars ($2,500.00). The administrative hearing officer may also order abatement of the violation. Furthermore, where the provisions of chapter 28 conflict with the provisions of this section, this section shall govern.

Comment [EL101]: Need to verify with City Atty Office whether this section or other sections apply.

(b) *Class 2 Misdemeanor:* Pursuant to A.R.S. section 48-3615, it is unlawful and is hereby declared a class 2 misdemeanor for any person to engage in any development or by any acts to cause a diversion, retardation or obstruction to the flow of waters in a watercourse whenever it creates a hazard to life or property and without securing the permit required by any provision of this chapter. Any person found guilty of violating this section shall be punished by a fine not to exceed more than seven hundred fifty dollars ($750.00) or four (4) months' imprisonment, or both. In addition, a person convicted of a class 2 misdemeanor may be placed on probation for a period not to exceed twenty-four (24) months.

(Ord. No. 7407, § 5, 6-25-90; Ord. No. 10311, § 1, 8-8-06)

Sec. 26-11.4. Declaration of public nuisance; abatement.

All development located or maintained in a floodplain since August 8, 1973, in violation of Title 48, Chapter 21, Article 1 of the Arizona Revised Statutes or of floodplain regulations established by this chapter and without written authorization from the ~~floodplain board~~Floodplain Board is a public nuisance per se and may be abated, prevented or restrained by action of the City of Tucson.

(Ord. No. 10311, § 1, 8-8-06)

Sec. 26-12. Appeals and variances.

(a) *Appeals.* Any written decision of the city engineer made in the course of administering or interpreting this ordinance may, within thirty (30) days of the decision, be appealed to the ~~floodplain board~~Floodplain Board.

(b) *Variances.* The ~~floodplain board~~Floodplain Board shall hear and decide all requests for variances from the requirements of this ordinance.

(1) A variance may be granted only if, based on technical evidence prepared by an Arizona registered professional engineer, the ~~floodplain board~~Floodplain Board finds all of the following:

a. A showing of good and sufficient cause.

b. That the variance is the minimum necessary, considering the flood hazard, to afford relief.

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c. That failure to grant the variance would result in exceptional hardship to the applicant. An exceptional hardship is one that is exceptional, unusual and peculiar to the property involved. Mere economic or financial hardship alone is not exceptional. Inconvenience, aesthetic considerations, personal preferences or the disapproval of one's neighbors likewise cannot, as a rule, qualify as an exceptional hardship. All of these problems can be resolved through other means without granting a variance, even if the alternative is more expensive, or requires the property owner to build elsewhere or put the parcel to a different use than originally intended.

d. That the granting of the variance will not create a danger or hazard to life or property in the area, or result in increased flood heights; additional threats to public safety; extraordinary public expense; the creation of a nuisance; the victimization of or fraud on the public; and that the variance is not in conflict with other city ordinances or regulations.

e. That special circumstances, such as size, shape, topography, location, or surroundings of the property would cause strict application of the regulations to deprive the property of privileges enjoyed by similar property in the floodplain or erosion hazard areas.

(2) A variance is subject to conditions to ensure that the variance does not constitute a grant of special privileges inconsistent with the limitation on similar property in the floodplain or erosion hazard areas.

(3) If the ~~floodplain board~~Floodplain Board grants a variance from the provisions of this division, the city engineer shall provide written notice to the grantees of the variance as required by A.R.S. section 48-3609(J) that the property may be ineligible for exchange of state land pursuant to the statutory flood relocation and land exchange program. The city clerk shall record a copy of the notice in the office of the county recorder so that the notice appears in the chain of title of the affected parcel of land.

(4) The issuance of a variance to construct a structure below the base flood level may result in increased premium rates for flood insurance ~~up to amounts as high as twenty-five dollars ($25.00) for one hundred dollars ($100.00) of insurance coverage~~ as determined by the insurance carrier and NFIP regulations.

(5) The floodplain administrator shall maintain a record of all variance actions, including justification for their issuance and report such variances issued in its biennial report submitted to FEMA every two years.

(c) *Application and hearing*. The following application and hearing procedures apply to an appeal of a decision of the city engineer, or a variance request, or combination thereof:

Comment [EL102]: Increase in insurance rates shall be determined by NFIP regulation (unless FEMA has directive for this issue).

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Comment [EL103]: Clarifying verbiage - every two years per TDOT meeting.

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(1) The application shall be in writing and filed with the city engineer. The application shall include technical evidence prepared by an Arizona registered professional engineer in support of the appeal or variance request.

a. An application for an appeal shall state why the decision of the city engineer is in error and shall contain a concise explanation of all matters in dispute and any pertinent maps, drawings, data or other information in support of the appeal.

b. An application for a variance shall state the code section from which the variance is sought and shall include any pertinent maps, drawings, data or other information why the variance should be granted.

(2) Incomplete applications shall not be accepted.

a. Within three (3) working days after the receipt of the application, or any additional materials or information as provided for below, the city engineer shall notify the applicant whether or not the application is deemed complete.

b. If the application is determined to be incomplete, the applicant shall submit additional materials and information as may be reasonably determined necessary by the city engineer.

(3) The ~~floodplain board~~Floodplain Board shall hold a public hearing to consider an appeal or variance request within sixty (60) days after the city engineer accepted the application. After the close of the public hearing the ~~mayor and council~~ Mayor and Council may:

a. Uphold, reverse or modify the decision of the city engineer on appeal.

b. Grant or deny the variance, subject to the findings for a variance set forth in these regulations.

(d) *Stormwater technical advisory committee (STAC).* The STAC shall make recommendations to the director of the department of transportation to be forwarded to the ~~mayor and council~~ Mayor and Council on technical issues raised by appeals and variance requests.

(1) Within three (3) days after accepting an appeal or variance request, the city engineer shall submit a copy of the appeal or variance request, together with all available pertinent documents and information to STAC. If STAC determines that the appeal or variance request raises technical questions or issues, STAC may review the request and provide written conclusions and recommendations to the ~~floodplain board~~Floodplain Board. The conclusions for a variance request must address the findings required in section 26-12(b)(1) for the granting of a variance by the ~~floodplain board~~Floodplain Board.

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(2) Reserved.

(e) *Stormwater advisory committee (SAC).* The SAC shall review all proposed amendments to Chapter 26 of the Tucson Code and shall provide written conclusions and recommendations to the director of the department of transportation to be forwarded to the ~~mayor and council~~ Mayor and Council and to the planning commission, as applicable, prior to a public hearing on the proposed amendments.

(Ord. No. 7407, § 5, 6-25-90; Ord. No. 8309, § 1, 9-26-94; Ord. No. 9582, §§ 4, 5, 8-6-01; Ord. No. 10311, § 1, 8-8-06)

Sec. 26-13. Enforcement.

It shall be the duty of the city engineer and all officers of the city otherwise charged with the enforcement of the law to enforce these floodplain or erosion hazard area regulations.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-14. Disclaimer of liability.

The degree of flood and erosion protection required by these regulations is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study. Larger floods may occur on rare occasions or the flood height may be increased by manmade or natural causes, such as bridge openings restricted by debris. These regulations do not imply that areas outside the floodplain or erosion hazard area boundaries or land uses permitted within such area will be free from flooding or flood and erosion damages. These regulations shall not create liability on the part of the city or any officer or employee thereof for any flood or erosion damages that may result from reliance on any administrative decision lawfully made thereunder.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-15. Coordination with other agencies.

The city engineer shall notify adjacent communities and the ADWR prior to any alteration or relocation of a regional or a major watercourse, and submit evidence of such notification to the Federal Insurance Administration.

(Ord. No. 7407, § 5, 6-25-90)

Sec. 26-16. Public hearing.

If a public hearing is required for any amendment of these regulations, it shall be held in accordance with the provisions of A.R.S. title 9 and title 48. The advisory body which will conduct the first public hearing will be either the citizens advisory planning commission (CAPC) in accordance with Tucson Code, chapter 23, article II, division 3,

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section 23-484 et seq., or such other committee, commission or hearing office as the ~~mayor and council~~ Mayor and Council by resolution may establish. The ~~mayor and council~~ Mayor and Council may also establish themselves as the body which conducts the public hearing. The public hearing and notice requirements will be conducted in accordance with A.R.S. title 9 and title 48. In cases where the provisions of either title are more restrictive, the more restrictive provisions will prevail.

(Ord. No. 7407, § 5, 6-25-90)

Secs. 26-17--26-19. Reserved.

ARTICLE II. STORMWATER MANAGEMENT

Comment [EL104]: Article II is not a part of this revision to code at this time. Remaining portion of Article II removed for this update of Floodplain Ordinance (Article I).

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